

## In Situ Guided Wave Structural Health Monitoring System, Phase I

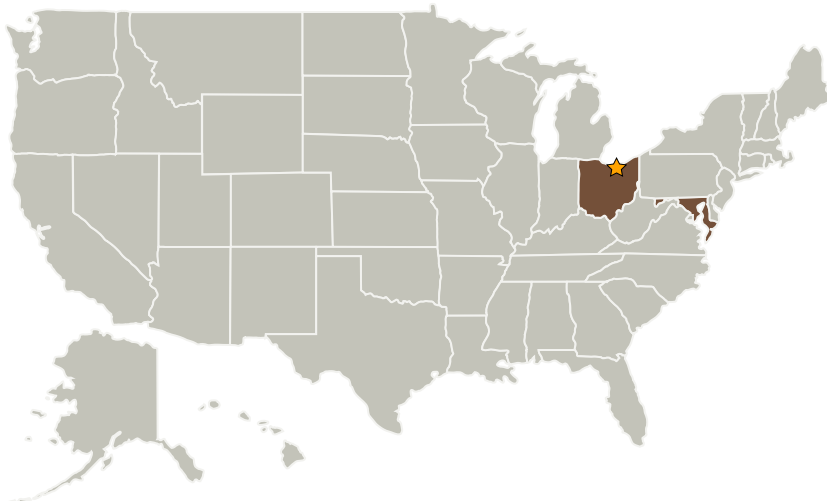
Completed Technology Project (2005 - 2005)



## Project Introduction

Corrosion and fatigue induced metal-loss and cracks are common problems for missiles and aircraft structures. A wide range of field conditions such as humidity, temperature, stress, cathode potential, and coating conditions, etc. all contributes to the electrochemical reaction between the incipient corrosive agent molecule and the structural metal matrix. The weakened inter-atomic force leads to the material loss, pits or crack growth and eventually structural failure. We propose a new approach to detect and characterize the corrosion and cracks in missile and aircraft structures. The technique consists of very small, low cost guided wave leave-in-place health monitoring sensors known as piezo-disks, innovative Correlation Analysis Technique (CAT) for fast defect sizing and localization, and a miniaturized local computing device with data acquisition and processing capabilities and wireless module for remote monitoring. It is envisioned the total cost of this system will be less than \$1500.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Intelligent Automation, Inc.	Supporting Organization	Industry	Rockville, Maryland



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Glenn Research Center (GRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations

Maryland

Ohio

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

George Zhao

## Technology Areas

### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.2 Structures
    - └ TX12.2.3 Reliability and Sustainment